MINNESOTA'S RESPONSES TO AGRICULTURAL WATER QUALITY CHALLENGES

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I. INTRODUCTION

Minnesota is blessed with an abundance of water. Being naturally modest, Minnesotans say it is the Land of 10,000 Lakes but the actual count is 11,842 lakes that are 10 acres or more, and it has 6,564 rivers and streams. Our lakes and rivers are important to most Minnesotans and are part of our identity as the Mississippi River headwaters state. Minnesota also is a strong agricultural and industrial state, and it faces the same challenges as other states with strong agricultural and industrial economies. Roughly 40 percent of Minnesota's waters are considered impaired.

Minnesota has significant assets and resources it is bringing to bear on the issue and there is reason for optimism for the future of the state's waters. Minnesota has a population that values clean water and is willing to support efforts to repair the state's waters and keep them clean. It has strong environmental advocates. It is building on decades of groundwork. It has had some courageous leaders. And now it has a range of powerful tools in its toolbox that should help the state reach its water quality goals.

II. MINNESOTA'S CLEAN WATER LEGACY ACT

The Minnesota Legislature passed the Clean Water Legacy Act (CWLA) in 2006 with the intent to "protect, enhance, and restore water quality in lakes, rivers, and streams and to protect groundwater from degradation, by providing authority, direction, and resources to achieve and maintain water quality standards for groundwater and surface waters, including the standards required by section 303(d) of the federal Clean Water Act, United States Code, title 33, section 1313(d), and other applicable state and federal regulations."[2] In passing the CWLA, the Legislature included these findings:

(1) there is a close link between protecting, enhancing, and restoring the quality of Minnesota's groundwater and surface waters and the ability to develop the state's economy, enhance its quality of life, and protect its human and natural resources;
(2) achieving the state's water quality goals will require long-term commitment and cooperation by all state and local agencies, and other public and private organizations and individuals, with responsibility and authority for water management, planning, and protection; and

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[2] Minn. Stat. §114D.10, Subd. 1.

(3) all persons and organizations whose activities affect the quality of waters, including point and nonpoint sources of pollution, have a responsibility to participate in and support efforts to achieve the state's water quality goals.[3]

The CWLA also created a Governor-appointed Clean Water Council to advise the administration on implementation of the CWLA.[4] Through the CWLA, the state adopted a watershed-based approach to assessing the quality of Minnesota's waters.[5]

III. THE LEGACY AMENDMENT

On November 4, 2008, Minnesota voters approved the Clean Water, Land & Legacy Amendment to the state constitution to:

- protect drinking water sources;
- protect, enhance, and restore wetlands, prairies, forests, and fish, game, and wildlife habitat;
- preserve arts and cultural heritage;
- support parks and trails; and
- protect, enhance, and restore lakes, rivers, streams, and groundwater.

The Amendment increased the sales and use tax rate by three-eighths of one percent on taxable sales, starting July 1, 2009 and continuing through 2034. Those dollars are dedicated to four funds: Outdoor Heritage Fund, Clean Water Fund, Parks and Trails Fund, and Arts and Cultural Heritage Fund. The Clean Water Fund budget for the 2020-21 biennium is $261 million.

IV. MINNESOTA'S NUTRIENT REDUCTION STRATEGY

Created in 2014, Minnesota's Nutrient Reduction Strategy identified the then-existing statewide nutrient reduction efforts and identified measurable goals.[6] It established an overall target of a 20 percent nitrogen reduction in the Mississippi by 2025, and set a target date for reaching the 45 percent reduction goal at 2040.[7] For groundwater, the nutrient reduction goal was to "meet the degradation prevention goal of the Minnesota Groundwater Protection Act." The Nutrient Reduction Strategy identified these key cropland strategies:

- Advance the use of vegetative cover through riparian buffers and adoption of cover crops on short season crops, while working to advance cover crop and perennial crop options for Minnesota's climate and markets for perennials.

[3] Minn. Stat. §114D.10, Subd. 2.
[4] Minn. Stat. §114D.30.
[5] Minn. Stat. §114D.26.
[6] "The Minnesota Nutrient Reduction Strategy, Executive Summary," September 2014, https://www.pca.state.mn.us/sites/default/files/wq-s1-80.pdf
[7] *Id.*, p. 3.

- Work with farmers to improve soil health, which will include more crop residue and soil erosion control, especially for protection of soil during the increasing frequency of high intensity rains.
- Work with co-op agronomists, certified crop advisers, and agricultural producers on an educational campaign to achieve greater nutrient efficiencies. Provide greater confidence in reducing rates by offering crop nutrient insurance for reduced fertilizer rates and other self-demonstration projects.
- Increase education and outreach on water quality issues and BMPs [Best Management Practices] needed to reach nutrient reduction goals. Encourage participation and provide education through the Agricultural Water Quality Certification Program. Develop recognition programs for excellent nutrient management such as Watershed Heroes.
- Develop strong public-private partnerships to support increased delivery of voluntary BMPs and optimize opportunities to improve the rate of BMP adoption in targeted areas. Increase demonstrations, promotion and incentives for implementing tile drainage management, wetland construction and other practices to reduce nutrients from tile drainage waters.
- Provide the necessary research and demonstration that will lead to increased adoption of cropland BMPs.[8]

The targets were set to be reached by 2025. A mid-point progress report is expected to be completed by the end of 2019. As set forth below, the state is the process of implementing several of these key strategies.

V. STATUTORY FRAMEWORK

A. Multi-agency jurisdiction

Jurisdiction over different aspects of Minnesota's water policy lies with different agencies.[9] With regard to groundwater, the authority is vested as follows:

- Minnesota Pollution Control Agency (PCA): water quality monitoring and reporting and the development of best management practices and regulatory mechanisms for protection of groundwater from nonagricultural chemical contaminants.[10] The MPCA also has responsibility for feedlot permitting.[11]
- Minnesota Department of Agriculture (MDA): sustainable agriculture, integrated pest management, water quality monitoring, and the development of best management practices and regulatory mechanisms for protection of groundwater from agricultural chemical contaminants.[12]

[8] *Id*., p. 13.
[9] *See generally*, Minnesota Statutes Chapters 103A to 114B.
[10] Minn. Stat. §103A.204(a)(2).
[11] Minn. Rules 7001.0020 (permit rules) and Minn. Rules 7020.2000-.2226 (technical rules)
[12] Minn. Stat. §103A.204(a)(3).

- Minnesota Department of Natural Resources (DNR): water quantity monitoring and regulation, sensitivity mapping, and development of a plan for the use of integrated pest management and sustainable agriculture on state-owned lands.[13]
- Minnesota Department of Health (MDH): regulation of wells and borings, and the development of health risk limits.[14]
- Board of Soil and Water Resources (BWSR):[15] reporting on groundwater education and outreach with local government officials, local water planning and management, and local cost share programs.[16]
- Environmental Quality Board (EQB): coordination of state groundwater protection programs.[17]

B. Minnesota's Groundwater Protection Act

The Minnesota Legislature passed the Groundwater Protection Act (GPA) in 1989. The Goal of the GPA is

> . . . that groundwater be maintained in its natural condition, free from any degradation caused by human activities. It is recognized that for some human activities this degradation prevention goal cannot be practicably achieved. However, where prevention is practicable, it is intended that it be achieved. Where it is not currently practicable, the development of methods and technology that will make prevention practicable is encouraged.[18]

Under the GPA, the Commissioner of Agriculture is charged with certain obligations regarding "agricultural chemicals" in groundwater. Agricultural chemicals include pesticides, fertilizers, plant amendments, and soil amendments.[19] The Commissioner of Agriculture must develop and promote the implementation of best management practices, evaluate the effectiveness of best management practices, evaluate the detection of pollutants in groundwater, and, if the implementation of best management practices has proven to be ineffective, may adopt water resource protection requirements.[20]

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[13] Minn. Stat. §103A.204(a)(5).
[14] Minn. Stat. §103A.204(a)(6).
[15] The Minnesota Board of Water and Soil Resources (BWSR) consists of 20 members. Members can be citizens, state agency staff, or local government representatives that deliver BWSR programs. The board is the state's administrative agency for 90 soil and water conservation districts, 46 watershed districts, 23 metropolitan watershed management organizations, and 80 county water managers. Board members, including the board chair, are appointed by the Governor.
[16] Minn. Stat. §103.204(a)(4).
[17] Minn. Stat. §103.204(a)(1).
[18] Minn. Stat. §103H.001.
[19] Minn. Stat. §103H.005 Subd. 2.
[20] Minn. Stat. §103H.151 Subds. 2, 4; 103H.251 Subd. 1; 103H.275 Subd. 1(a) and (b).

C. Groundwater Protection Act Implementation Timeline (Non-regulatory)

1. 1990: First Nitrogen Fertilizer Management Plan (NFMP)

   The MDA created a Nitrogen Fertilizer Task Force, which consisted of representatives from commodity groups, farm organizations, the University of Minnesota, environmental groups, and agencies. The 1990 NFMP recommended that the Nitrogen Fertilizer Management Plan consist of 3 phases (following the GPA):

   - Promotion of Best Management Practices (BMPs)
   - Evaluation of BMP adoption and effectiveness
   - Response to evaluation phase

2. 1991: The first University of Minnesota-developed BMPs were ratified through an MDA public notice and comment process.

3. 1993: The MDA conducted the first farm surveys regarding nutrient management.

4. 1993 – Present: Promotion, education, evaluation of BMPs.

5. 2010-2015: NFMP revision.

6. Nitrogen Fertilizer Management Plan (2015)

   a. The NFMP is the state's blueprint for minimizing groundwater impacts from the use of nitrogen fertilizer

   b. Key Goals for the NFMP:

      - To encourage and promote science-based practices to reduce nitrate in groundwater while maintaining farm profitability;
      - To target areas vulnerable to groundwater contamination; and
      - To work with local farmers and agronomists to address local areas with elevated nitrate in groundwater.

VI. VOLUNTARY INCENTIVE-BASED APPROACHES: MINNESOTA AGRICULTURAL WATER QUALITY CERTIFICATION PROGRAM

The Minnesota Agricultural Water Quality Certification Program (MAWQCP)[21] is a first of its kind, voluntary opportunity for farmers and agricultural landowners to take the lead in implementing conservation practices that protect Minnesota's water. The program works on a farm-by-farm, field-by-field basis, identifying and mitigating agricultural risk to water quality.[22]

The MAWQCP was initially formed through a 2012 Memorandum of Understanding (MOU) that was the culmination of talks led by then-Governor Mark Dayton, United States Department of Agriculture (USDA) Secretary Tom Vilsack, and U.S. Environmental Protection Agency (EPA) Administrator Lisa Jackson. The MOU stated that Minnesota's state agencies responsible for overseeing issues at the nexus of agriculture and water quality, including the MDA, PCA, DNR, and BWSR, would jointly deliver the program with the MDA acting as the lead agency.

The MAWQCP is operated as a federal/state partnership between the State of Minnesota, the United States Department of Agriculture, and Minnesota's 88 Soil and Water Conservation Districts. Certification happens through partnerships with local SWCDs. The program also partners with industry leaders such as Land O'Lakes Inc., Hormel Foods, and Central Farm Service.

Through this program, certified producers receive:

- Regulatory certainty: certified producers are deemed to be in compliance with any new water quality rules or laws during the period of certification.[23]
- Recognition: certified producers may use their status to promote their business as protective of water quality.
- Priority for technical assistance: producers seeking certification can obtain specially designated technical and financial assistance to implement practices that promote water quality.

The MDA received a Regional Conservation Partnership Program contract and, through a close working relationship with the USDA Natural Resources Conservation Service, those funds go to the certified producers for implementing practices. In 2016, the MDA began offering financial assistance grants of up to $5,000 (75% cost share) to producers seeking to become certified. These mini-grants are designed to work in concert with and supplement financial assistance from NRCS and other sources. The cost to administer the

[21] Minnesota Statutes §§17.9891-17.992.

[22] For more information on the Minnesota Agricultural Water Quality Certification Program, *see* https://www.mda.state.mn.us/environment-sustainability/minnesota-agricultural-water-quality-certification-program and Spike Johnson, "Fisherman, Farmers and the Gulf Coast Dead Zone," The Weather Channel, *available at*: https://features.weather.com/collateral/shrinking-the-gulf-coast-dead-zone/.

[23] Minn. Stat. §17.9897. In addition, the agencies that have any jurisdiction over water quality (PCA, BWSR, and DNR) have entered into an inter-agency MOU that confirms their commitments to provide regulatory certainty to certified farmers.

program has decreased as more acres became certified and the process has become more streamlined. As of January 2019, the cost was $28.04 per acre.

As of August 26, 2019, the MAWQCP has certified 783 producers with 523,959 acres. More than 1,600 new practices have been implemented, and approximately 60,000 acres of cover crops have been planted (in addition to the 45,000 or so acres already in place at the start of the program). As a result, 32,270 tons of sediment, 94,710 tons of soil, and 43,007 pounds of phosphorous are being kept out of Minnesota's waters every year. In addition, the practices implemented will result in a reduction in greenhouse gases of 32,733 CO2 tons per year.

VII. EDUCATION

The number of educational programs that address agricultural water quality in Minnesota are too numerous to describe here, but technical assistance and peer-to-peer education programs are the gold standard, and the MDA and BWSR, along with on-the-ground partners in the Soil and Water Conservation Districts, Extension, and agricultural groups, engage thousands of farmers each year in such programs. [24]

Two examples of successful education programs include the Root River Field to Stream Partnership (RRFSP) and the Nutrient Management Initiative. The Root River is located in the karst region of Southeast Minnesota, which is extremely vulnerable to groundwater contamination. The RRFSP is comprised of farmers and their advisors, the MDA, the Minnesota Agricultural Water Resources Center, the Nature Conservancy, Fillmore County, Mower County and the Root River Soil and Water Conservation Districts, Monsanto, other state agencies, and academic researchers. The program started with baseline monitoring for five years. More than 90 percent of the farmers in the area agreed to have a field walk-over to identify the highest risk areas of their land. The RRFSP then identified practices that would mitigate those risks. To date, 90 grass waterways spanning more than 65,000 linear feet have been installed in high priority areas; 13 new water and sediment control basins and catchment ponds were installed in targeted locations; nearly 200 acres of cover crops have been planted; 74 acres of Conservation Reserve Program pollinator habitat were seeded on a highly erodible field; and feedlot improvements have been implemented in high risk locations.[25]

The Nutrient Management Initiative is a very popular program that provides mini-grants of $800 - $1,000 to corn or wheat growers and their crop advisors for field trials in which farmers can evaluate their nutrient management practices on their fields. The farmers and their crop advisors set up field trials and record and share their results. Individual results are kept confidential but the aggregated results help guide current nitrogen rate recommendations.[26] To date, approximately 500 on-farm field trials have been established.

[24] *See* https://bit.ly/2Ny4DBO for a description of MDA programs.
[25] *See* https://bit.ly/2KZ069Q for more information and a video about the Root River Field to Stream Partnership.
[26] *See* https://bit.ly/2NCq70q for more information.

VIII. RESEARCH

A. Forever Green Initiative

The Forever Green Initiative, led by the University of Minnesota and the MDA, is developing new perennial and winter annual crops that preserve and enhance water quality, and is supporting the development of new supply chains that provide profitable markets for these crops. A recent focus of the Forever Green Initiative is the development of kernza – getting it into production and getting it commercialized.[27]

B. Township Testing Program

While not a true research program, the MDA conducts a Township Testing Program (TTP) that is an outgrowth of the NFMP. The MDA selected townships in which 30 percent of the township is vulnerable to groundwater contamination and 20 percent is in row crop production. Under the TTP, private well owners are offered free well testing kits that test for nitrates. Those samples are sent to a certified lab in a prepaid mailer. If nitrate is detected in the water sample, the homeowner is offered an opportunity to have his or her well tested by a trained professional. If the well owner chooses to have the second test done, the samples are analyzed for nitrates and pesticides. The professional also inspects the well and the area around the well to determine if the well itself is defective and if there is a point source that is contributing to the high nitrate levels.

Well owners are notified of their test results. The individual results are kept confidential but data is aggregated. As of February 2019, 306 vulnerable township from 42 counties participated in the TTP from 2013-2018. In the 306 townships tested, 44 percent have 10 percent or more of their wells over the Health Risk Limit (HRL) of 10 mg/L for nitrate. In 114 townships, less than 5 percent of the wells were over the HRL. Overall, 9.2 percent of the 30,769 wells tested exceed the HRL.[28]

IX. REGULATORY RESPONSES

Over the past five years, Minnesota has developed two regulatory approaches to addressing agricultural water quality issues.

[27] For more information on the Forever Green Initiative, *see* https://www.forevergreen.umn.edu/.
[28] Minnesota Department of Agriculture, Township Testing Program Update-June 2019, *available at*: https://www.mda.state.mn.us/sites/default/files/inline-files/ttpupdate201906.pdf.

A. Buffer Law

In 2015, the State Legislature passed a law requiring perennial vegetative buffers of up to 50 feet along lakes, rivers, and streams; and buffers of 16.5 feet along public ditches, in an effort to filter out phosphorous, nitrogen, and sediment.[29] The rollout of the Buffer Law and the law itself have been very controversial. [30] A spokesperson for the Minnesota Soybean Growers Association referred to it as a thorn in the side of farmers. Some farmers objected to its "one size fits all" approach while others objected to having to take land out of production without compensation, especially in such difficult economic times.[31]

The deadline for implementing buffers on public waters was November 1, 2017, and implementation of that provision was 96 percent complete as of December 2018. The deadline for public ditches was November 1, 2018, although there was some flexibility built in. Compliance with that provision was at about 70 percent as of June 2019.[32]

B. Groundwater Protection Rule

Minnesota enacted its first rule under the 30-year old Groundwater Protection Act in June 2019.[33] The Groundwater Protection Rule (GPR) was based on the 30 years of work that had previously been done by the Minnesota Department of Agriculture under the Groundwater Protection Act.[34]

1. Authority

The authority for the Groundwater Protection Rule is found in Minnesota Statute §103H.275, Subd. 1(b):

> [F]or agricultural chemicals and practices, the commissioner of agriculture may adopt water source protection requirements under subdivision 2 that are consistent with the goal of section 103H.001 and are commensurate with the groundwater pollution if the implementation of best management practices has proven to be ineffective.

and Minnesota Statute §103H.275 Subd. 2(a):

[29] Minn. Stat. §103F.48.
[30] *See*, Dan Linehan, "Farmers Push Back on Buffer Strip Proposal," Mankato Free Press, March 14, 2015, https://bit.ly/2ZsKCDe.
[31] *See* Norozi, Mitra, "Most Minnesota farmers achieve buffer compliance, even as resentment lingers," AgWeek, June 18, 2019, https://bit.ly/2HqdIZw.
[32] Board of Water and Soil Resources, "Minnesota Buffer Law," https://bit.ly/2PgjMKu.
[33] Minnesota Rules, Chapter 1573.
[34] *See supra*, Section V.C.

> The Pollution Control Agency, or for agricultural chemicals and practices, the commissioner of agriculture shall adopt by rule water resource protection requirements that are consistent with the goal of section 103H.001 to prevent and minimize the pollution to the extent practicable.

The MDA supported the rule in a Statement of Need and Reasonableness that, among other things, summarized the efforts that had been made to promote the implementation of Best Management Practices and surveys showing implementation of Best Management Practices and practices regarding nutrient management.[35]

2. Rulemaking Process

In the summer of 2017, the MDA released a draft Groundwater Protection Rule for an informal comment period. During the 96 day informal comment period, MDA staff held 17 listening sessions across the state attended by approximately 1,500 attendees, met with about a dozen stakeholder groups, and received more than 800 written comments.

Based on the feedback received, the MDA made significant changes to the proposed rule. The MDA published a revised rule for formal comment April 30, 2018, with a 115-day comment period. The MDA hosted 8 informational meetings and held five formal Administrative Law Judge Hearings across the state.[36] More than 3,000 written comments were submitted.

In May 2018, at the end of the Legislative session, the House and Senate Agriculture Committees invoked Minn. Stat. §14.126, which states:

> If the standing committee of the house of representatives and the standing committee of the senate with jurisdiction over the subject matter of a proposed rule both vote to advise an agency that a proposed rule should not be adopted as proposed, the agency may not adopt the rule until the legislature adjourns the annual legislative session that began after the vote of the committees.

On October 1, 2018, the Chief Administrative Law Judge issued a report with her findings that: 1) the MDA has the statutory authority to adopt the proposed Groundwater Protection Rule, 2) the MDA followed the legal requirements to promulgate the Groundwater Protection Rule, and 3) the

[35] The Statement of Need and Reasonableness containing the documentation supporting the need for and reasonableness of the Groundwater Protection Rule can be found at: https://bit.ly/2ZoOIYW.

[36] Minnesota Statutes, section 14.14, subdivision 1b, states: "When a public hearing is conducted on a proposed rule that affects farming operations, at least one public hearing must be conducted in an agricultural area of the state." The MDA held five ALJ hearings in agricultural areas.

proposed Rule is needed and reasonable (the legal standard for rulemaking), with the exception of certain provisions which vested too much discretion in the commissioner of agriculture.[37]

On November 20, 2018, the MDA submitted a revised rule addressing the provisions previously not approved by the ALJ. On November 29, 2018 the Chief ALJ issued a report finding that prior deficiencies had been corrected, the MDA changes to the rule did not render it substantially different, and the MDA's proposed Groundwater Protection Rule complied with all procedural requirements. Although she had no authority to rule on the issue, the Chief ALJ also stated that MDA may not adopt the rule until after the 2019 Legislative Session.[38] The MDA approved the rule and the Governor did not veto it, so Minnesota's Groundwater Protection Rule became effective on June 24, 2019.

3. Structure of the Rule

The GPR has two parts. Part One focuses on restrictions to fall application of nitrogen fertilizer in areas with vulnerable groundwater, or the protection area around public wells with elevated nitrate - called Drinking Water Supply Management Areas (DWSMAs). Part Two focuses on addressing elevated nitrates in DWSMAs that have high nitrate levels.

a. Part One

With certain exceptions noted below, Part One of the rule prohibits the application of nitrogen fertilizer after August 31 or on frozen soil in vulnerable groundwater areas, which includes coarse textured soils, soils that are shallow to bedrock, and the karst region.[39] Application on an entire quarter section is prohibited if 50% or more of the quarter section is considered vulnerable.[40] It also prohibits the application of nitrogen fertilizer in DWSMAs with nitrate-nitrogen levels equal to or greater than 5.4 mg/L at any point in the previous ten years.[41] The MDA has developed an interactive map that allows anyone to search for their address to see if their land is subject to Part 1 restrictions.[42] The MDA must update this map no later than January 15 of each year so that farmers will know by then if their land will be subject to the fall application restrictions. This provision will take effect in 2020.

[37] Report of the Chief Administrative Law Judge, October 1, 2018, *available at*: https://mn.gov/oah/assets/9024-35205-agriculture-groundwater-protection-rules-report_tcm19-354508.pdf.
[38] Order of the Chief Administrative Law Judge on Review of Rules, November 20, 2018, *available at*: https://mn.gov/oah/assets/9024-35205-agriculture-rules-chief-order-review_tcm19-361687.pdf.
[39] Minn. Rules 1573.0030 Subp. 1.A(3)(a).
[40] Minn. Rules 1573.0030 Subp. 1.A(2).
[41] Minn. Rules 1573.0030 Subp. 1.A(3)(b).
[42] The interactive map can be found on the MDA's website: https://bit.ly/2r25qxd.

Certain areas are excluded or excepted from the rule's Part 1 restrictions. Many of these exclusions or exceptions were incorporated into the rule based on feedback received after the first draft of the rule was received. They include:

- Cold Climate exclusions: County exclusions are based on precipitation and evapotranspiration rates and a short planting season.
- Counties with little cropland: Counties are excluded if less than 3% of the land is used for cropland.
- Specific crops: Exceptions are in place for winter grains, perennial crops, grass seed, cultivated wild rice, and fall cover crops on potatoes.
- MAP and DAP: When applying ammoniated polyphosphate (MAP and DAP) or other formulations, farmers can apply up to 40 pounds of nitrogen per acre in the fall. Fields that have very low to low phosphorus levels are not subject to the 40 pounds per acre total nitrogen limit.[43]

An estimated 2.6 million acres, or 12.6% percent of Minnesota's crop land, are classified as vulnerable under Part 1 of the rule.

b. Part Two

Part Two of the rule applies to DWSMAs with elevated nitrate levels. The goal of Part 2 is prevention – to take action before a public water system exceeds the health standard of 10 mg/L nitrate-N (nitrate-nitrogen). This part of the rule is structured using a sliding scale of voluntary and regulatory actions based on the concentration of nitrate in the public wells and the implementation of BMPs. All areas will begin at a voluntary level and move up only one level at a time.

- There are 4 levels: Levels 1 and 2 are voluntary; Levels 3 and 4 are regulatory.
    - **Level 1**: DWSMAs that are at 5.4 to less than 8 mg/L nitrate-N.[44]
    - **Level 2**: DWSMAs that have exceeded 8 mg/L at any point during the previous 10 years **or** are projected to exceed 10 mg/L in the next 10 years.[45]

[43] Minn. Rules 1573.0030 Subp. 3.A.
[44] Minn. Rules 1573.0040 Subp. 3.A(1).
[45] Minn. Rules 1573.0040 Subp. 3.A(2).

- **Level 3** (Regulatory): An area will move to Level 3 regulation if:

  - After no fewer than three growing seasons the BMPs are not adopted on 80% of the cropland acres (excluding soybean acres) and the Level 2 criteria are still met; **or**
  - After no fewer than three growing seasons the residual soil nitrate below the root zone increases; **or**
  - After three growing seasons or the estimated lag time, whichever is longer, the nitrate concentration continues to increase.[46]

If any of these criteria are present, the Commissioner of Agriculture will issue an order containing specific Water Resource Protection Requirements that can include: mandating implementation of nitrogen fertilizer BMPs, record keeping, education, field testing, nutrient management plans, soil amendments, plant amendments, or use of N-inhibitors. In addition, the Commissioner can require Alternative Management Tools (AMTs) if full funding is available for them.[47] AMTs are practices and solutions other than BMPs and can include precision agriculture or cover crops.[48] The MDA is required to maintain a list of AMTs on its website.[49]

- **Level 4** (Regulatory): An area will move from Level 3 to Level 4 regulation if:

  - Nitrate-N in the public water supply well exceeded 9 mg/L for any three samples in the previous 10 years; **or**
  - After no fewer than three growing seasons the residual soil nitrate below the root zone increases; **or**
  - After no fewer than three growing seasons or the estimated lag time, whichever is longer, the nitrate levels continue to increase.[50]

[46] Minn. Rules 1573.0040 Subp. 7.C-E.
[47] Minn. Rules 1573.0070 Subp. 1.
[48] Minn. Rules 1573.0010 Subp. 2.
[49] Minn. Rules 1573.0090 Subp. 1.A.
[50] Minn. Rules 1573.0040 Subp. 8.C-E.

If any of these criteria are present, the Commissioner of Agriculture will issue an order that can contain any of the requirements from a Level 3 order and anything allowed by the statutory definition of a Water Resource Protection Requirements (WRPRs), which include "design criteria, standards, operation and maintenance procedures, practices to prevent releases, spills, leaks, and incidents, restrictions on use and practices, and treatment requirements."[51]

While the definition of a WRPR is very broad, there are two parameters: one general, the other specific. First, The Minnesota Groundwater Protection Act mandates that WRPRs "must be based on the use and effectiveness of best management practices, the product use and practices contributing to the pollution detected, economic factors, availability, technical feasibility, implementability, and effectiveness."[52] The economic factors to be weighed must include "economic impacts both to affected farmers as well as to area residents who must bear the costs of treatment of public water supplies that have been contaminated with nitrate."[53] Several rural communities have had to or are facing the need to upgrade their rural water systems, at significant cost, which in turn gets passed on to rural rate payers who often do not have the means to bear such costs.

Second, the Groundwater Protection Rule specifically does not allow the Commissioner to "restrict the selection of the primary crop" or require a nitrogen fertilizer rate below the lowest end of the University of Minnesota recommended rate.[54]

Anyone subject to a WRPR contained in a Commissioner's order may petition for a contested case hearing or seek judicial review.[55] An exception can be provided if a Responsible Party (someone subject to a WRPR) can show that he or she cannot implement the practices because of adverse weather conditions, crop failure, or if the practice is agronomically or technically unsuitable.[56]

The Groundwater Protection Rule allows for the creation of Local Advisory Teams starting at Level 2 for the development of BMPs and again at Level 3 for the development of AMTs.[57] Although the definition of Local Advisory Team in the rule itself is fairly general

[51] Minn. Stat. §103H.005 Subd. 15.
[52] Minn. Stat. §103H.275 Subd. 2(a).
[53] Minnesota Department of Agriculture Statement of Need and Reasonableness, April 30, 2018, p. 146.
[54] Minn. Rules 1573.0070 Subp. 2C.
[55] Minn. Rules 1573.0050 Subps. 3, 6.
[56] Minn. Rules 1573.0070 Subp. 3.
[57] Minn. Rules 1573.0040 Subp. 4.A and Minn. Rules 1573.0070 Subp. 1.B.

("a team of individuals approved by the commissioner who advise the commissioner regarding appropriate response activities of a specific local area."[58]), the Statement of Need and Reasonableness explains the Local Advisory Team concept:

> The intent is to develop a team which will consist of 15-20 people who are from the area, including farmers, crop advisors/consultants, representatives of local groups/organizations, representatives of public water supply systems (in … DWSMAs), and government staff and/or professionals who can provide technical or financial support. The majority of the members will be local farmers and their crop advisors/consultants.[59]

This will be a critical element for the success of the rule's implementation. The old adage that "all conservation is local" has been affirmed through the experience of those who have been working in this field over the past several decades. The strong feedback received through comments and at the listening sessions was that most farmers and their advisors are intimately familiar with their soil and what will and will not work from an agronomic perspective. A survey of farmers conducted by the University of Minnesota included a question on whom farmers turn to and trust for conservation advice. That survey showed that farmers' #1 trusted advisor for conservation advice is their agronomist/crop advisor, followed by the County's Soil and Water Conservation District. [60]

Currently, there are about 30 DWSMAs with nitrate levels at or above 5.4 mg/L, with just under 100,000 acres of cropland – which is less than 0.5 percent of the statewide cropland.

As noted above, significant changes were made to the first draft of the rule. The rule's strong focus is on protecting public drinking water sources. And while some farmers object to having any regulation and some conservationists criticize the rule as being too slow, the GPR did seem to strike a balance, and getting it done is a major milestone. The board chairman of the Minnesota Corn Growers Association called the final rule "reasonable," and said it smartly targets hot spots. A spokesperson for the Friends of the Mississippi recognized that the rule is "a giant step for the Minnesota Department of Agriculture." [61]

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[58] Minn. Rules 1573.0010 Subp. 14.
[59] Minnesota Department of Agriculture Statement of Need and Reasonableness, April 30, 2018, p. 83.
[60] Dr. Lucia Levers, "Socioeconomic Analyses of Conservation Practices for Water Quality," February 25, 2019, *available at*: https://www.pca.state.mn.us/sites/default/files/wq-cwc2-19b.pdf.
[61] Jennifer Bjorhus, "Landmark farm rule aims to protect Minnesota's drinking water," Minneapolis Star Tribune, June 9, 2019, http://strib.mn/2MFpQu2.

X. CONCLUSION

Former Minnesota Department of Agriculture Commissioner Dave Frederickson said that, as the Headwaters State of the Mississippi River, Minnesota has a "moral obligation" to the states below to take care of its waters. Because of the decades of perseverance on the part of advocates, dedicated public servants,[62] and courageous policy makers, Minnesota now has more water quality tools in its toolbox than most agricultural states, including education, incentivization, and regulation, which will help it fulfill its moral obligations as the Mississippi Headwaters State and the Land of 10,000 Lakes.

[62] In particular, the MDA staff who worked on laying the foundation for the Groundwater Protection Rule and the Rule itself (Dan Stoddard, Bruce Montgomery, Larry Gunderson, Katie Wolf, Doug Spanier, and Jeff Berg) did so with great professionalism and few thanks. I wish to publicly and formally thank them here.